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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/727,031	12/02/2003	Je-Kwang Cho	5649-1212	4447

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EXAMINER	
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ART UNIT	PAPER NUMBER
2815	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/727,031	CHO, JE-KWANG	
	Examiner	Art Unit	
	Michael B. Shingleton	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Final rejection supercedes the previous Final rejection whose date should be around 9-18-2007 and addresses the newly added claims 32-34 presented in the amendment whose date should be around 5-4-2007. Again applicant is referred to the response to the arguments presented in the previous office action. Applicant's claims are just not so limited as applicant may believe. Again a varactor is a type of capacitor and the claims do not recite a negative limitation relating to the switched capacitor section that excludes the use of these types of capacitors. Should applicant in a later amendment amend the claims to recite that the switched capacitor section does not include varactor elements then there must be clear support in the original disclosure for this negative limitation in order to avoid a new matter rejection. The examiner must give the broadest reasonable interpretation to the claims and this is all the examiner has done and continues to do. The examiner just cannot read limitations into the claims In re Geums, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Also in the recent Halliburon Energy Services, Inc v M-I LLC, Fed. Cir, 2007-1149 decision it is noted that "[w]e note that the patent drafter is in the best position to resolve ambiguity in the patent claims, and that it is highly desirable that the patent examiners demand that applicant's do so in appropriate circumstances so that the patent can be amended during prosecution rather than attempting to resolve the ambiguity in litigation". The patent examiner just cannot amend the claims to overcome the prior art; it should be that of the "patent drafter" to make it clear in the claims as to the structure that is different from the prior art as the above case-law makes clear.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 5, 8, 11, 14-16 23-25, 28, 29 and 32-34 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rotzoll US 5,739,730 (Rotzoll).

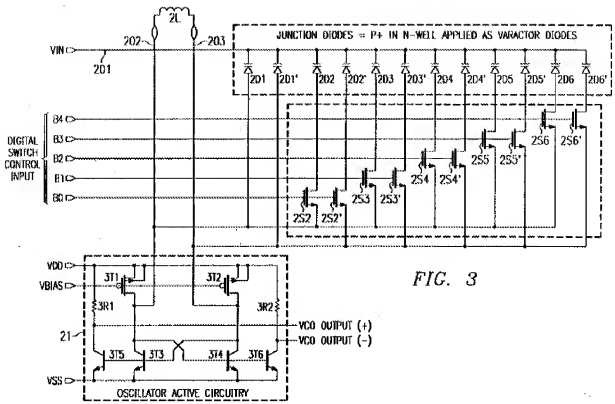

FIG. 3

Figure 3 of Rotzoll.

Note that in the following rejection of the above indicated claims that most if not all of these claims are of such breath that they do not limit the capacitance elements of the switched capacitor structure to be any thing different from the capacitor elements of the switched varactor structure. Thus as noted below some of the varactor elements of Rotzoll being capacitors will read on the switched capacitor structure with the remaining varactor elements reading on the capacitor elements of the switched varactor arrangement. Varactors are a type of capacitor. The claims do not exclude these types of capacitors as forming the capacitors of the switched capacitor section as the above has already made clear. Figure 3 and the relevant text of Rotzoll disclose a voltage controlled oscillator (VCO) and an associated method for operating a VCO having the steps/structure of supplying a whole inductance or inductor 2L, providing a non-switched varactor unit 2D1 and 2D1' that includes varactors 2D1 and 2D1' wherein the non-switched varactor unit changes the "whole capacitance" of the VCO in accordance with a control voltage 201, providing a switched capacitor unit composed of varactor capacitors like 2D2 and 2D2' wherein the

switched capacitor unit changes the whole capacitance depending upon a plurality of digitally controlled switches like 2S2 and 2S2', and providing a switched varactor unit composed of varactors like 2D6 and 2D6' that changes the whole capacitance depending upon the plurality of digitally controlled switches like 2S6 and 2S6' and the control voltage 201. The arrangement and method of Rotzoll provides for the step/structure of generating an amplified oscillation signal at VCO OUTPUT whose frequency changes in response to the changes in the whole inductance and the whole capacitance. Note that a varactor is a special form of capacitor where the plates of the capacitor are formed by the p and n-type regions and the intrinsic forms the insulative layer of the capacitor. The amplifier section of Rotzoll is actually composed of two amplifiers. Such is the case with most differential amplifier arrangements. Thus the claimed limitation setting forth that the amplifier comprises a (singular) bipolar transistor is meet by either one of the elements 313-316 of Rotzoll. The amplifier arrangement of Rotzoll also includes a FET or "field effect transistor" formed by elements 311 or 312. Rotzoll is silent on calling the amplifier arrangement a transconductance amplifier. However, note that the voltage at the input of the transistors 313-316 is converted to a current and converted back to a voltage via load elements like 311, 312, 3R1 and 3R2. Thus Rotzoll is a transconductance amplifier.

In addition to that above, applicant has added functional language to the control circuit where applicant apparently believes limits the claims to two sets of control signals wherein these two sets of controls signals are "copies" of each other. As noted below the examiner respectfully disagrees that the claims are so limited as applicant suggests. The language is very broad for the control circuit of the prior art does select the switches control the switches based the signals supplied to the switches i.e. there must be a voltage/current that causes the switches to switch and a selection of a set of these switches provides for a constant ratio of the capacitances of the varactors to the whole capacitance and therefore does in fact limit a variation in a ratio of the capacitances of the varactors to the whole capacitance.

Newly presented claims 32-34 recites items like the control circuit includes a plurality of switch select outputs and this is what happens in the prior art so as to control which capacitive element either of the switched capacitor section and/or of the switched varactor section is switched in or out of the circuit to control the overall capacitance. See Figure 3 of Rotzoll.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Albon US2003/0048,145 (Albon) in view of Prakash et al. 5,648,744 (Prakash) and Rotzoll 5,739,730 (Rotzoll).

Figure 3 and the relevant text of Albon disclose a voltage controlled oscillator (VCO) and method for operating the VCO. (Note that this method also can be considered "A method for changing the oscillation frequency of a VCO.). Albon provides for a whole inductance by element L1. Albon also provides for a whole capacitance as is clearly illustrated in Figure 3 of Albon. Figure 3 of Albon also shows an amplifying unit that provides for the step of amplifying through the use of transistors M_1 and M_2. The amplifying unit of Albon is a differential arrangement much like that of Figure 7 of the instant application. A differential amplifier unit is one that the composed of two amplifiers. The one amplifier of Albon is composed of M_1 with one half of L_1 forming the load for this amplifier and the other amplifier of Albon is composed of M_2 with the other half of L_1 forming the load for this amplifier. These transistors M_1 and M_2 are clearly shown as MOSFETs in Albon. However, bipolars are a well-known art recognized equivalent structure. It would have been obvious to one having ordinary skill in the art at the time the invention was made to (modification) since the examiner takes Official Notice of the equivalence of bipolars for FETs and FETs for bipolars for their use in the electronic art and the selection of any of these known equivalents to provide a transistor function would be within the level of ordinary skill in the art. (Note that art recognized equivalence is an accepted motivation as set forth in at least MPEP 2144.03, 2144.06 and 2144.07.). The amplifier unit of Albon clearly generates output oscillation signals at the two nodes between the loads and the transistors M_1 and M_2. A "combined" oscillation signal is also present between these two nodes as is clearly illustrated by Figure 1 of Albon. While Albon is silent on calling the amplifiers that make up the amplifier unit "transconductance" amplifiers such is the case for the voltage at the input of these transistors M_1 and M_2 is transformed to a current which the loads transforms back to a voltage. This is done in the same manner as that shown in Figure 7 of the instant application. Because Albon is a VCO with variable reactance elements, it goes without saying that the oscillator frequency will change with changes in the values of these reactive elements. In particular note that the variations in the whole capacitance of Albon and note how this changes the operating frequency as recited

through out Albon. There are two main ways that Albon changes the "whole capacitance", one is by providing a non-switched varactor unit (CV1 and CV2 for example.) whose capacitance value is controlled by the value of the control voltage "tunes". The second main way Albon changes the "whole capacitance" is by providing a switched capacitor unit formed on either or both ends of the whole inductance L_1. The switches of the switched capacitor unit are controlled by a control unit. The control unit like that shown in Figure 6 of Albon also produces the control voltage. Thus the control unit of Albon selects the switches and applies a "designated" control voltage to set the oscillation frequency. The functional language "while limiting a variation in gain of the amplifier across a range of oscillation frequencies" is an obvious consequence of the arrangement of Albon since any inherent limiting of a variation in the gain of the amplifier across a range of oscillation frequencies meets this limitation. (The limitation is very broad.) Claims like claim 10 recites that the VCO is in a phase locked loop (Note at least Figure 6 of Albon.).

Albon is silent on the construction of the capacitors that make up the capacitors of the switched capacitor arrangement. One art recognized equivalent capacitor is the varactor. A varactor is a well-known type of capacitor.

Prakash of record and Rotzoll both disclose that the capacitors that make up a switched capacitor can be composed of varactors. The use of varactors in the switched capacitor structure has the additional advantage that varactors switched or not switched can be controlled by a control voltage. Thus further fine-tuning for the channel selection is possible with such a switched capacitor arrangement that is composed of varactors as capacitance elements as compared to a switched capacitor arrangement that does not employ variable capacitance elements. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replaced at least some of the capacitors of the switched capacitor unit of Albon with varactors and utilize a tune voltage to adjust these varactors because as the Albon reference is silent on the exact construction of these capacitor elements one of ordinary skill in the art would have been motivated to use any art-recognized equivalent capacitor element such as the varactors as taught by Prakash or Rotzoll. In addition to that above one of ordinary skill in the art would have been additionally motivated to replace one or more of the plurality of capacitors of the switched capacitor arrangement of Albon with varactors so as to allow for the added benefit of fine tuning of the switched capacitor unit as taught by both Prakash of record and Rotzoll. (Note that the varactors in the arrangement made obvious above are pn-junction diode structures.)

With respect to claims like claim 6, here the selection of the capacitance values of the switched capacitor unit is to follow the claimed formula. Likewise with respect to claims like claim 7, here the

selection of the capacitance values of the varactors of the switched varactors is to follow the claimed formula.

The selection of these capacitance values to follow the claimed formulas or values set forth in claims like claims 6 and 7 merely set forth the workable range for the system of that made obvious above. This has been long held to involve mere routine skill in the art. The selection of the capacitance values is also a result effective variable in that the selection determines how large or how small the steps in oscillation will be. Accordingly it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the values of the capacitances to be within the values as claimed (formulas as claimed.), since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233. (Note that optimization is a long held accepted motivation to make the modification. See at least MPEP 2144.05)

With respect to claims like claim 4, here claim 4 recites that the control unit is configured to switch the switched varactors and the switched capacitors "simultaneously". This supposedly will limit variations in "a" gain of the amplifier when changing the oscillation frequency. It is just common sense that one would want to switch both the switched varactors and the switched capacitors in the invention made obvious above simultaneously so as to change channels or frequency ranges as quickly as possible. It would not make sense to switch one and then wait and switch the other for this would result in the whole capacitance being changed to an undesirable value that would cause the output frequency to be changed to an undesirable value in between switching operations. Thus not switching both the switched capacitors and the switched varactors at the same time would be against that taught by the prior art of Albon, Prakash and Rotzoll. Accordingly, it would have been obvious to one of ordinary skill in the art to switch the switched varactor and the switched capacitor unit of that made obvious above simultaneously so as to allow for the changing of the frequency in a "quick" manner while not changing the capacitance and hence the frequency to a undesirable value in between switching operations which would be against the teachings of Albon, Prakash and Rotzoll. In other words one of ordinary skill in the art would have been motivated to switch the switched switched capacitors as the same time given the teachings of Albon, Prakash and Rotzoll to not switch to undesirable capacitance levels between channel changes.

With respect to claims like claim 9, here a formula presented that merely represents the total capacitance $C_{v,k}$ of the capacitance arrangement. Since the claimed and disclosed capacitance

arrangement of the instant application is the same as that made obvious above, the capacitance value $C_{v,k}$ of the invention made obvious above will have the same value as that claimed.

With respect to claims like claims 21 and 30 here the functional language that recites that the control circuit switches on or off the switches of the switched capacitors and switched varactors "such that the whole capacitance is adjusted to minimize the rate of variation in a gain of the oscillator". This is merely another case of optimization that has been long held to be within the level of one of routine skill in the art. One of routine skill would have set the switching times, the capacitance switched, etc. so to optimize the operation of the device. Accordingly it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the values of the capacitances to be within the values as claimed and switched at the appropriate times etc. so as to "minimize the rate of variation in a gain of the oscillator" since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. In re Aller, 105 USPQ 233. (Note that optimization is a long held accepted motivation to make the modification. See at least MPEP 2144.05). In additional to that above, note that claims like claim 4 recites that it is the simultaneous switching that will "limit variations". While "limit variations" is not the same as minimize the rate of variation, from the original disclosure the simultaneous switching is minimizing the rate, the simultaneous switching of the structure would have been obvious and in fact it is the only common sense way to do the switching. Thus the function of minimizing the rate of the variation like that set forth in claims like claims 30 is an obvious consequence of the structure/method made obvious above.

In addition to that above, applicant has added functional language to the control circuit where applicant apparently believes limits the claims to two sets of control signals wherein these two sets of controls signals are "copies" of each other. As noted below the examiner respectfully disagrees that the claims are so limited as applicant suggests. The language is very broad for the control circuit of the prior art does select the switches control the switches based the signals supplied to the switches i.e. there must be a voltage/current that causes the switches to switch and a selection of a set of these switches provides for a constant ratio of the capacitances of the varactors to the whole capacitance and therefore does in fact limit a variation in a ratio of the capacitances of the varactors to the whole capacitance.

Response to Arguments

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker, can be reached on (571)272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MBS
December 21, 2006
August 5, 2008

/Michael B. Shingleton/
Michael B Shingleton
Primary Examiner
Group Art Unit 2815